WE CLAIM:

1. A wireless communication device, comprising:

an antenna configured for communication over a wireless network; and

a data processing system in communication with the antenna, the data processing system including a protocol stack for facilitating communication with a network resource via the wireless network, the protocol stack comprising an intermediate protocol layer configured for monitoring a transmission of electronic data from the antenna for subsequent reception by the network resource and for initiating retransmission of unsuccessfully transmitted ones of the datagrams at a retransmission rate based on a running average of acknowledgment times for successfully transmitted ones of the datagrams.

2. The communication device according to claim 1, wherein the intermediate protocol layer comprises a message monitor configured to wait for receipt of an acknowledgement signal transmitted by a wireless recipient of the transmitted electronic data in response to a successful transmission of one of the transmitted data over the wireless network, and to update the running average in accordance with a duration of each wait.

3. The communication device according to claim 2, wherein the message monitor is configured to initiate the retransmission in accordance with a predetermined exponentially increasing retransmission interval based on the running average.

4. The communication device according to claim 3, wherein the exponentially increasing retransmission interval has a finite maximum limit.

5. The communication device according to claim 2, wherein each said electronic message comprises message data, the intermediate protocol layer further comprises a message processor in communication with the message monitor, the message processor is configured to encapsulate the message data in a transport layer data segment, and the message monitor is configured to

encapsulate the transport layer data segment in a link layer datagram, the link layer datagram comprising a message class indicator identifying the message data, and a datagram sequence number uniquely associated with the link layer datagram.

6. The communication device according to claim 5, wherein the transport layer data segment comprises a transport layer header including a source message identifier assigned by the message processor, a destination message identifier assigned by a wireless recipient of the message data, and a radio address uniquely associated with the wireless communication device.

7. The communication device according to claim 6, wherein the protocol stack includes a physical protocol layer in communication with the intermediate protocol layer, the physical protocol layer being configured to encapsulate each said datagram in a physical layer header, the physical layer header including a device address associated with a wireless recipient of the transmitted datagram.

8. A method of wireless data communication between a wireless communications device and a land-based network resource, the network resource being in communication with an access server over a land-based network, the method comprising the steps of:

initiating transmission of electronic messages from the wireless communication device to the access server over a wireless network;

at the wireless communication device monitoring successful transmission of the message over the wireless network; and

at the wireless communication device initiating retransmission of unsuccessfully transmitted ones of the messages at a retransmission rate based on a running average of acknowledgment times for successfully transmitted ones of the messages.

9. The method according to claim 8, wherein the retransmission step comprises initiating the retransmission in accordance with a predetermined exponentially increasing retransmission interval based on the running average.

10. The method according to claim 9, wherein the exponentially increasing retransmission interval has a finite maximum limit.

11. The method according to claim 8, wherein the monitoring step comprises the steps of for each said transmitted message waiting an acknowledgement time period for receipt of an acknowledge signal generated by the access server in response to a successful transmission of the message to the access server, and updating the running average in accordance with each acknowledgement time period.

12. An access server for facilitating communication between a network resource interfacing with the access server over a land-based network and a wireless communications device interfacing with the access server over a wireless network, the access server comprising:

a network interface for communicating with the network resource over the land-based network;

an antenna for communicating with the wireless communications device over the wireless network; and

a data processing system in communication with the network interface and the antenna, the data processing system including a protocol stack comprising a first physical protocol layer for facilitating communication over the wireless network, an intermediate protocol layer in communication with the first physical protocol layer, a second physical protocol layer for facilitating communication over the land-based network, and an application protocol layer in communication with the intermediate protocol layer and the second physical protocol layer for mapping message data between the wireless communications device and the network resource.

13. The access server according to claim 12, wherein the intermediate protocol layer comprises a message processor configured to initiate transmission over the wireless network of an acknowledgement signal to the wireless communications device in response to a successful reception of a wireless message datagram from the wireless communication device.

14. The access server according to claim 13, wherein the intermediate protocol layer is configured to monitor a transmission of land-based message datagrams directed to the wireless communications device by the network resource and for initiating retransmission of unsuccessfully transmitted ones of the land-based message datagrams at a retransmission rate based on a running average of acknowledgment times for successfully transmitted ones of the land-based message datagrams.

15. The access server according to claim 14, wherein the intermediate protocol layer comprises a message monitor in communication with the message processor, the message monitor being configured to wait for receipt of an acknowledgement signal transmitted by the wireless communications device in response to a successful transmission of one of the land-based messages over the wireless network, and to update the running average in accordance with a duration of each wait.

16. The access server according to claim 15, wherein the message monitor is configured to initiate the retransmission in accordance with a predetermined exponentially increasing retransmissions interval based on the running average.

17. A method of wireless data communication between at least one land-based network resource and at least one wireless network communications device, the method comprising the steps of:

providing at least one network resource and an access server in communication with the network resource over a land-based network for facilitating communication between at least one wireless communication device and the at least one network resource;

at the access server receiving over the wireless network a wireless-based message datagram from the at least one wireless communication device intended for transmission to the at least one network resource;

at the access server initiating transmission over the wireless network of an acknowledgement datagram to the at least one wireless communications device in response to a successful reception of the received wireless-based message datagram; and

directing the successfully received wireless-based message datagram to the at least one network resource over the land-based network.

18. The method according to claim 17, further comprising the steps of at the access server receiving at least one land-based message datagram from one of the network resources intended for transmission to one of the wireless communication devices, monitoring successful transmission of the land-based message datagrams over the wireless network, and initiating retransmission of unsuccessfully transmitted ones of the land-based message datagrams at a retransmission rate based on a running average of acknowledgment times for successfully transmitted ones of the land-based message datagrams.

19. The method according to claim 18, wherein the monitoring step comprises the steps of for each said transmitted land-based message datagram waiting an acknowledgement time period for receipt of an acknowledge datagram generated by the wireless communications device in response to a successful transmission of the land-based message datagram to the wireless communications device, and updating the running average in accordance with each acknowledgement time period.

20. A data structure for facilitating communication over a wireless network, comprising:

a message;

a transport layer data segment encapsulating the message, and

a link layer datagram encapsulating the transport layer data segment, the link layer datagram comprising a datagram sequence number and a message class indicator.

21. The data structure according to claim 20, wherein the transport layer data segment comprises a transport layer header including a source message identifier assigned by the

originator of the data segment, a destination message identifier assigned by the access server, and a radio address uniquely associated with the originator of the data segment.